JASON®

Industrial / Hydraulic Hose

Selecting the Proper Hose for the Application

HOSE SELECTION - STAMPED

It is important to have all the required information to select the proper hose for any hose application. The acronym "STAMPED" can be used to remember the required information as follows:

Size | Temperature | Application | Ends | Material Or Media | Pressure | Delivery

SIZE

S stands for SIZE: Inside diameter (I.D.) and length; any outside diameter (O.D.) constraints

- Overall length should be specified to include fittings
- Tolerances need to be specified if special requirements exist

I.D., O.D., and overall length of the assembly

- To determine the replacement hose I.D., read the layline printing on the side of the original hose. If the original hose layline is painted over or worn off, the original hose must be cut and the inside diameter measured for size.
- The inside diameter of the hose must be adequate to keep pressure loss to a minimum, maintain adequate flow, and avoid damage to the hose due to heat generation or excessive turbulence. The hose should be sized according to the nomographic chart referenced at the end of this section.
- Length Tolerances:

Assembly Length Tolerance			
Inches		Milimeters	
Up to 18	+/- 0.125	Up to 450	+/- 3
18 to 36	+/- 0.25	450 to 900	+/- 6
36 to 50	+/- 0.50	900 to 1270	+/- 13
Over 50	+/- 1%	Over 1270	+/-1%

- Flow Rate/Fluid Velocity - The flow rate of the system in conjunction with the inside diameter of the hose will dictate the fluid velocity through the hose. Typical fluid velocities can be seen in the nomographic chart found at the end of this section. Please consult Jason for specific recommended velocity ranges. Please note that suction line recommendations are different than pressure lines. See the nomographic chart at the end of this section, which provides a simple determination of which ID is recommended.

TEMPERATURE

T stands for TEMPERATURE of the material conveyed and environmental conditions.

- Are there factors such as heat sources in the environment in which the hose will be used?
- Continuous (average) and minimum and maximum temperatures have to be specified for both the environment and material conveyed.
- Note whether flame resistance or flammability will be an issue.
- Will there be sub-zero exposure?
- Care must be taken when routing hose near hot manifolds, and in extreme cases, a heat shield may be advisable.
- Other things to consider: maximum intermittent ambient temperature, fluid temperature, ambient temperature, and maximum temperature.

APPLICATION

A stands for APPLICATION, the conditions of use

- Configuration/routing (add a sketch or drawing if applicable)
  - Is the hose hanging, laying horizontally, supported, unsupported (orientation and aspect of the hose)?
  - What else is attached to the hose? Any external load on the hose, bend radius requirements, flexibilit contraction or elongation considerations with working pressure?
- Quantify anticipated movement and geometry of use requirements
- Intermittent or continuous service
- Indoor or outdoor use
- Unusual mechanical loads
- Excessive abrasion
- Electrical conductivity or non-conductivity requirements
- Equipment type
- External conditions - abrasion, oil (specify type), solvents (specify type), acid (specify type and concentration), ozone, salt-water
- Hose now in use
  - Type of hose
  - Service life being obtained and description of failure or source of customer dissatisfaction
- Strength and frequency of impulsing or pressure spikes
- Non-flexing application (static) or flexing application (dynamic)
- Vacuum requirements

MATERIAL OR MEDIA

M stands for the MATERIAL or MEDIA being conveyed, type and concentration

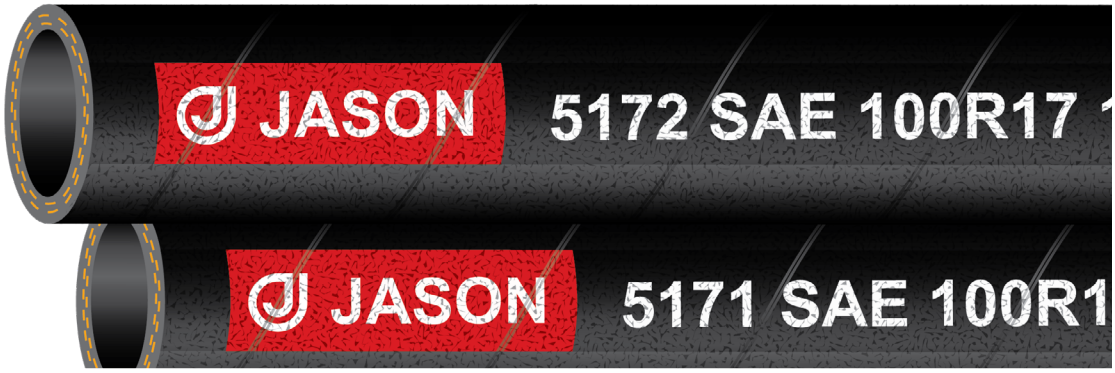
- Are there special requirements for this hose tube?
  - Any special specifications (or agency requirements) that need to be considered (e.g., FDA, API)?
  - Will the material be continuously flowing or sit in the hose for long periods of time (specify)?
- Media velocity, flow rate
- Chemical name/concentration (MSDS)
- Solids, description and size
- Fluid Compatibility - Some applications require specialized oils or chemicals to be conveyed through the system. Hose selection must assure compatibility of the hose tube. In addition to the hose materials, all other components, which make up the hose assembly (hose ends, o-rings, etc.) must also be compatible with fluid being used. Depending on the fluid, your hose supplier may lower the maximum temperature or pressure rating of the industrial hose assembly (see Table 2). When selecting any hose assembly, always consult Jason for recommendations.

PRESSURE

P stands for the PRESSURE to which the assembly will be exposed

- System pressure, including pressure spikes, must be considered. Hose assembly working pressures must be equal to or greater than the system pressure. Pressure spikes greater than the maximum working pressure will shorten hose life and must be taken into consideration.
- Temperature implications
- Vacuum considerations
- Maximum Operating Pressure - This is the maximum pressure that the system should be exposed to in normal operating conditions. For hydraulic hose assemblies, this pressure should be indicated by the relief setting of the system. Both the hose and hose ends should not be rated to a pressure less than the maximum operating pressure of the system.
- Pressure Spikes - When a hydraulic system is subjected to a large load in a short period of time, the system pressure can overshoot the relief pressure and exceed the maximum operating temperature. Frequent pressure spikes can reduce the life of hose assemblies. Also, keep in mind that hoses may move (contract or elongate) under pressure and this must be accounted for in routing and protection of the hose from chafing.

Please consult us if multiple constructions meet your needs.



ENDS

E stands for ENDS; style, type, orientation, attachment methods, etc.

- Uncoupled or coupled hose; hose with built-in fittings
- Specify end style (see couplings & accessories section of Jason catalogs)
- Materials and dimensions (steel, stainless, etc.)
- Conductivity requirements that need to be managed appropriately (See Grounding Instructions at the end of this document)

DELIVERY

D stands for DELIVERY

- Specific to customer requirements
- Testing requirements
- Certification requirements
- Special packaging requirements
- Tagging requirements
- Also refers to Determined Overall Length when working with metal hose

PRESSURE RE-RATING PERCENTAGES
FOR INCREASED TEMPERATURES

As temperatures go up, pressure ratings go down on certain types of industrial hoses. When considering the proper hose for any application, check this table if temperature is a consideration in the decision. This table will indicate the percentage of the initial working pressure of the assembly by temperature. This does not apply to hydraulic hoses used for intended hydraulic applications as their working pressures are rated at the maximum working temperatures.

Table 2
PRESSURE RE-RATING PERCENTAGES FOR INCREASED TEMPERATURES

Temperature		PVC Hose (%)	Steam & Hot Asphalt (%)	All Other Hose Types (%)
°F	°C			
70	21	100	100	100
90	32	82	95	91
150	66	30	81	64
200	93	N/R	68	42
250	121	N/R	56	20
300	149	N/R	44	N/R
350	177	N/R	32	N/R
400	204	N/R	20	N/R
450	232	N/R	8	N/R
500	260	N/R	N/R	N/R

N/R = Not Recommended

NOMOGRAPHIC CHART

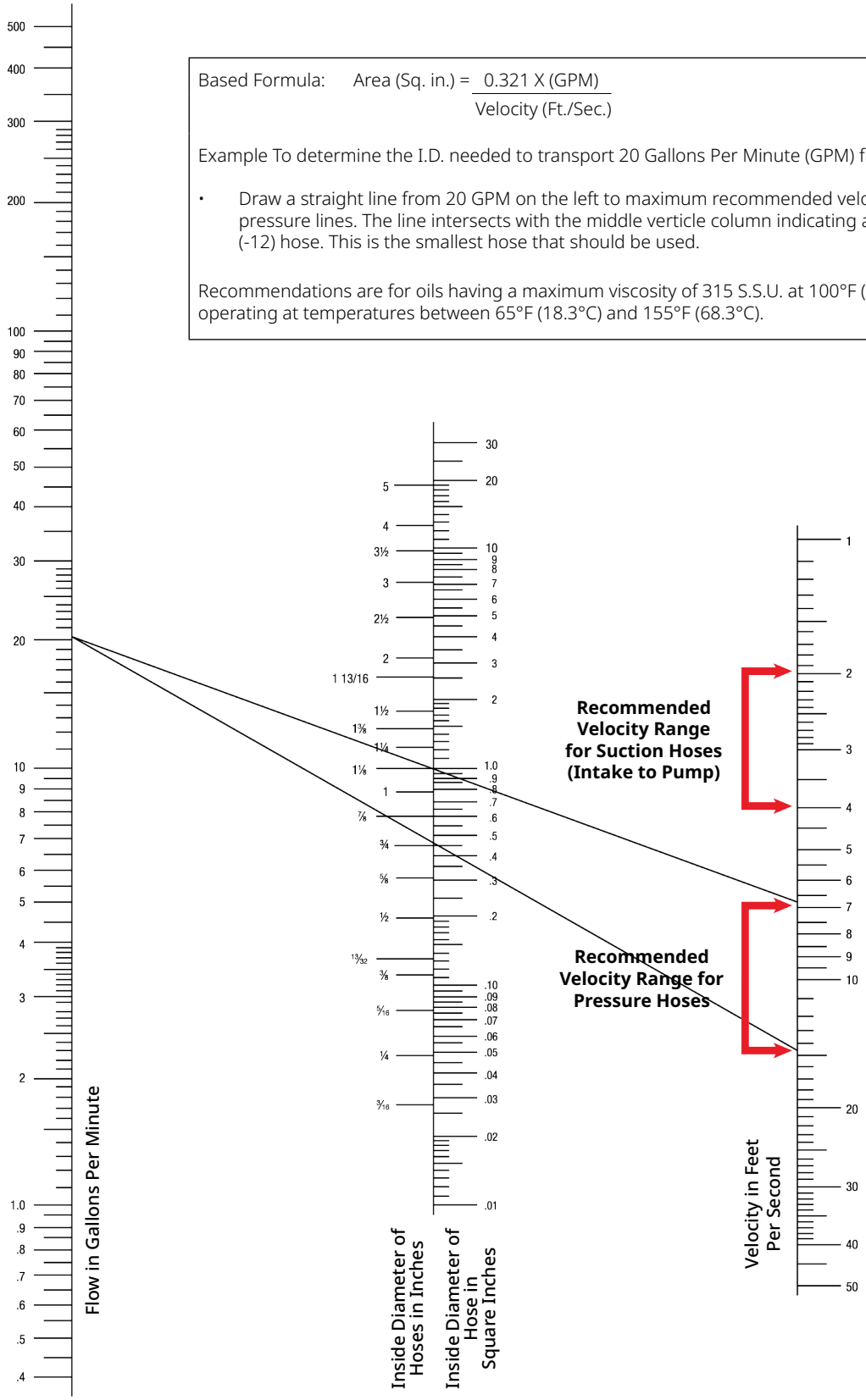
Flow Capacity of Hose Assemblies at Recommended Flow Velocities

Based Formula: Area (Sq. in.) = $\frac{0.321 \times (GPM)}{\text{Velocity (Ft./Sec.)}}$

Example To determine the I.D. needed to transport 20 Gallons Per Minute (GPM) fluid volume.

- Draw a straight line from 20 GPM on the left to maximum recommended velocity for pressure lines. The line intersects with the middle verticle column indicating a 3/4" I.D. (-12) hose. This is the smallest hose that should be used.

Recommendations are for oils having a maximum viscosity of 315 S.S.U. at 100°F (37.8°C), operating at temperatures between 65°F (18.3°C) and 155°F (68.3°C).



COMMON TERMS

COMMON TERMS	
Term	**Definition**
I.D.	Inside diameter of hose opening
O.D.	Outside diameter of hose
Max W.P.	Maximum recommended working pressure
PSI	Pressure in pounds per square inch
Weight/ft.	Weight per foot of hose
Bend Radius	The minimum bend radius to which the hose will bend before it is damaged
Standard Lengths	The bulk length that the hose is stocked for distributors
Safety Factor	All hose has a minimum burst point or safety factor. For example, an air hose with a 300 psi working pressure and a 3:1 safety factor has a minimum burst of 900 psi, or 3 times the working pressure. However, the working pressure and safety factor of an assembly can be significantly altered if incorrect fittings or clamps are used or if the assembly is improperly assembled. No hose is to ever be used at or near the burst pressure for any reason/do not exceed the rated working pressure.
RMA	Rubber Manufacturer's Association – replaced by ARPM
ARPM	Association of Rubber Products Manufacturers
ASTM	American Society for Testing and Materials
MSDS	Material Safety Data Sheet
API	American Petroleum Institute
FDA	Food and Drug Administration

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THREAD CHART

THREAD CHART			
Abbreviation	**Thread Name**	**Seal Method**	**Thread Compability**
GHT	Garden Hose Thread	Washer Seal	GHT – GHT
JIC 37° Flare	Joint Industrial Council	Mechanical Seal	JIC Male – JIC Female
NH or NST	American Standard Fire Hose Thread National Hose or National Standard Thread	Washer Seal	NH or NST – NH or NST
NPT	American Standard Taper Pipe Thread National Pipe Thread	Thread Sealant or Washer Seal	NPT – NPT or NPTF
NPTF	American Standard Taper Pipe Fuel Dryseal National Pipe Tapered Fuel	Thread Sealant or Washer Seal	NPTF – NPTF or NPT
NPSH	American Standard Straight Pipe for Hose Couplings National Pipe Straight Hose	Washer Seal	NPSH – NPSH or NPT
NPSM	American Standard Straight Mechanical Joints National Pipe Straight Mechanical	Washer Seal or Mechanical Seal	NPSM – NPSM, NPT OR NPTF
SAE 45° Flare	Society of Automotive Engineers	Mechanical Seal	SAE MALE – SAE Female
Note: Thread sealant is required for Thread Seal connections, except for NPTF during initial use. Use on NPTF is recommended.			
Note: Compatibility of thread type does not ensure compatibility of fittings. Always use mating fittings of the same type			

COMMONLY USED RUBBER COMPOUNDS			
ASTM	**Common Name**	**Composition**	**General Properties**
AU or EU	Urethane	Polyester Urethane	Excellent abrasion, tear and solvent resistance, good aging. Poor high-temperature properties
CR	Neoprene*	Chloroprene	Good weathering resistance and flame retarding. Moderate resistance to petroleum-based fluids. Good physical properties.
EPDM	Ethylene Propylene Rubber	Ethylene-propylene diene-monomer	Excellent ozone, chemical, and aging characteristics. Good heat resistance. Poor resistance to petroleum-based fluids.
NBR	Nitrile	Acrylonitrile butadiene	Excellent resistance to petroleum-based fluids. Moderate resistance to aromatics. Good physical properties.
NR	Natural Rubber	Isoprene, Natural	Excellent physical properties, including abrasion and low-temperature resistance. Poor resistance to petroleum-based fluids
SBR	SBR	Styrene-Butadiene	Good physical properties, including abrasion resistance. Poor resistance to petroleum-based fluids.
XLPE	Cross-Linked Polyethylene	Polyethylene and cross-linking agent	Excellent chemical resistance, with good heat and electrical properties.

* DuPont registered trademark

ARPM Oil Resistance Data

The effects of oil on rubber depend on a number of factors that include the type of rubber compound, the composition of the oil, the temperature and the length of exposure. The ARPM has developed a classification of hose performance based on simple immersions in ASTM IRM 903 oil (High Swell) at 212°F for 70 hours. Oil resistance classifications for rubber stocks are shown in the table below.

HOSE PHYSICAL PROPERTIES AFTER EXPOSURE TO OIL			
Classification	**Oil Resistance**	**Volume Change Maximum**	**Tensile Strength Retained**
Class A	High	+25%	80%
Class B	Medium/High	+65%	50%
Class C	Medium	+100%	40%

COMMONLY USED PLASTIC COMPOUNDS

ASTM	Common Name	Composition	General Properties
PE	Polyethylene	Polyethylene	Excellent dielectric properties. Excellent resistance to water, acids, alkalis, and solvents. Good abrasion and weathering resistance.
UHMW-PE	UHMWPE	Ultra High Molecular Weight Polyethylene	Excellent resistance to a broad range of chemicals, excellent weight and abrasion resistance.
PVC	PVC	Polyvinyl Chloride	Good weathering, moisture, and flame resistance. General resistance to alkalis and weak acids. Good abrasion resistance.
TPE	Thermoplastic Rubber	Thermoplastic Polyolefins And Block Copolymers of Styrene and Butadiene	Good weathering and aging resistance. Good for water, diluted acids, and bases.

Important Instructions

for Properly Grounding Industrial Hoses Containing Static Wires or Helical Wire

The flow of certain materials inside of a hose can cause a dangerous static charge to build up. When the static charge reaches a sufficient level, it can shock or create an electrical discharge which can lead to fire and explosions.

Unless proper steps are taken during hose assembly, even hoses that have built-in grounding wires (conductive wire or helical wire) will not provide sufficient grounding to eliminate static charge build-up which can lead to property damage, injury, or death.

Step 1.

Identify the type of mechanism used in the particular hose for providing the grounding path.

Step 2.

The mechanism (the conductor being a special grounding wire or helical wire) must be carefully exposed on both ends of the length of hose and enough length (at least 1/2" or 13 mm) exposed to allow placement into direct contact of the clean metallic coupling insert. This is normally done by bending the wire inside of the tube surface which will provide sufficient contact with the insert. Care should be exercised that the tube is not damaged and that the length of conductor is not so long as to create a leak path along the insert.

Step 3.

Assemble the coupling as specified by the manufacturer. Suitable lubricant may be used that will not interfere with the conductive path.

Step 4.

After assembly, you must properly verify that the hose is conductive from end to end (10 Ohms or less). If not, the assembly is not suitable for use. It should be understood that both the points of connection to the hose must continue to provide conductivity to ground for the system. Special requirements beyond this level of conductivity may be required. If so, the assembler and user must take additional steps as may be required to assure compliance.

About Jason

Founded in 1958 in Fairfield NJ, Jason quickly gained a solid reputation as a go to source for both industrial hose and power transmission belts. Products, supported by reliable stocks and knowledgeable customer care quickly enabled Jason to become well recognized as a solid partner to distributors across the States. In subsequent decades, Jason expanded its successful Fairfield business model across the US opening distribution centers in Carol Stream, IL; Tampa, FL; Dallas, TX; Los Angeles, CA and Portland, OR. Outside of the US, expansion took place in Canada, Mexico, Brazil, Colombia and Peru.

In 2007, Jason was acquired by Megadyne and became part of the Megadyne Group. In 2018, the Megadyne Group joined with Ammeraal to create AMMEGA. Today, Jason is the Hose Division of AMMEGA Group serving North, Central and South America offering a wide range of both industrial and hydraulic hose, couplings, equipment and accessories.

Contact Us

www.jasonhosesolutions.com